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ABSTRACT

This speech provides concrete ways for school districts to save on energy costs, based on the general concept of flexibility in energy systems. These methods have been successfully implemented in the Salem (Oregon) school district. The first idea is to set up a weekly, rather than annual, bidding system to increase fuel price options. This provides the flexibility to respond to fluctuations in the world energy market, and thereby save considerably on fuel costs while choosing the best quality fuels from competing vendors. Converting boilers to burn either oil or gas will allow school districts to choose whichever fuel is less expensive from week to week. Other methods include selective heating of zones within a building (depending on time of day, usage, and sun exposure), heat recovery systems on air vents, and separate hot water heaters. Because electric companies charge a penalty for peak loads, timers on air circulation equipment enable schools to distribute kilowatt loads more efficiently. Slight decreases in room temperature and lighting also result in significant savings, as does preventive maintenance. Advice is also offered on raising the initial capital needed to institute energy conservation measures, by applying for federal and state grants or matching funds. (TE)

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FLEXIBILITY: THE KEY TO CUTTING ENERGY COSTS

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JOANNE STERN
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NATIONAL SCHOOL BOARD ASSOCIATION
APRIL 2, 1984

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ENERGY. KIDS HAVE MORE OF IT THAN THEY NEED. TEACHERS WISH THEY HAD MORE. SCHOOLS USE IT TO HEAT, COOL AND LIGHT THEIR BUILDINGS. BUT WE, AS SCHOOL BOARD MEMBERS, SEE ENERGY AS THAT HUGE DOLLAR AMOUNT LOOMING NEAR THE TOP OF THE BUDGET. WE DON'T LIKE APPROVING THAT BUDGET ITEM ANY MORE THAN WE LIKE PAYING OUR OWN HOUSEHOLD UTILITY BILLS. BUT IN THE END, WE APPROVE THE BUDGET ITEM SAYING,"WELL, WE'VE GOT TO HAVE HEAT IN THE BUILDINGS, STUDENTS NEED LIGHTS TO READ, AND WHO KNOWS WHAT THE FUEL MARKET WILL BE LIKE TOMORROW?"

I'M HERE TODAY TO TELL YOU THAT YOU HAVE MORE CONTROL OVER ENERGY COSTS THAN YOU MIGHT THINK. WE, TOO, CAN LEARN TO PLAY THE ENERGY GAME. AND IF WE PLAY SMART, WE CAN MAKE TODAY'S CHANGING FUEL MARKET WORK FOR US...NOT AGAINST US.

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I'LL BE TALKING ABOUT CONCRETE WAYS ANY SCHOOL DISTRICT...NO MATTER HOW BIG OR HOW SMALL...CAN SAVE ENERGY DOLLARS. THE SYSTEMS AND INVESTMENTS I'LL DESCRIBE WILL GIVE YOU A QUICK RETURN ON YOUR MONEY ... FROM 6 MONTHS TO 1-1/2 YEARS. ONCE YOU GET THAT FIRST PAYBACK, IT'S SIMPLY A MATTER OF REINVESTING SAVED ENERGY DOLLARS TO CONSERVE EVEN MORE ENERGY AND MORE DOLLARS.

LET'S THINK ABOUT IT. WHAT PART OF THE ENERGY PICTURE IS OUT OF OUR CONTROL? WHAT CAN WE CONTROL? AND HOW DO WE GO ABOUT GETTING THAT CONTROL?

WE KNOW WE CAN'T CONTROL THE WEATHER, AND WE CAN'T CONTROL WHAT KHOMENI DOES IN IRAN. BUT WE HAVE AN ENORMOUS AMOUNT OF CONTROL OVER WHAT WE HEAT, WHEN WE HEAT, HOW MUCH WE HEAT, THE KIND OF FUEL WE USE AND THE PRICE WE PAY FOR THAT FUEL.

THE KEY, SALEM SCHOOL DISTRICT DISCOVERED, IS FLEXIBILITY. TO GET MORE CONTROL OVER OUR ENERGY COSTS, WE MADE OUR ENERGY SYSTEMS MORE FLEXIBLE.

FOR EXAMPLE, WE SET UP A WEEKLY BIDDING SYSTEM TO INCREASE OUR FUEL PRICE OPTIONS.

IN THE PAST, THE SALEM SCHOOL DISTRICT ... LIKE MANY OTHER SCHOOL DISTRICTS ... WOULD REQUEST FUEL BIDS ONCE A YEAR AND ACCEPT THE LOW BID ON A KEEP-THE-TANKED-FILLED BASIS. WE WOULD PLUG THE FIGURE INTO OUR BUDGET AND THEN CRINGE AS WE WATCHED OIL DROP TO $31 AND THEN $30 A BARREL WHILE WE WERE STUCK WITH A CONTRACT PAYING $32 A BARREL.

AN ANNUAL OR EVEN A MONTHLY CONTRACT JUST DOESN'T HAVE ENOUGH FLEXIBILITY TO RESPOND TO THE CHANGING WORLD MARKETPLACE. WE FOUND THAT VENDORS WERE NOT IMMUNE FROM TAKING ADVANTAGE OF A PUBLIC AGENCY. AT THE SAME TIME, AN ESCALATION CLAUSE ALLOWED OUR SUPPLIERS TO INCREASE COSTS ACCORDING TO MARKET FLUCTUATIONS. OUR SUPPLIERS, AS THE SAYING GOES, HAD US OVER A BARREL, AND WE DIDN'T LIKE BEING ON THE LOSING END.

SO WE DECIDED TO CHANGE THE RULES OF THE GAME. FIRST, WE SENT OUT A QUESTIONNAIRE TO ALL OF OUR FUEL VENDORS ASKING IF THEY WOULD BE WILLING TO COOPERATE IN A WEEKLY BIDDING PROCESS IN AN EFFORT TO SAVE TAXPAYER DOLLARS. BEING CIVIC-MINDED BUSINESS REPRESENTATIVES AND TAXPAYERS THEMSELVES, ALL OF OUR SUPPLIERS CHEERFULLY RETURNED A SIGNED LETTER AGREEING TO COOPERATE.

THEN WE SAT DOWN AND WROTE A SET OF TIGHT SPECIFICATIONS, USING THE U.S. GOVERNMENT SPECIFICATIONS AS A MODEL. WE RECOMMEND THOSE SPECIFICATIONS TO YOU, BY THE WAY, BECAUSE THEY ARE VERY, VERY GOOD. THEY DESCRIBE IN DETAIL THE TYPE OF FUEL WE EXPECT TO BE DELIVERED.

IF WE GET BAD FUEL ... AND THAT HAS HAPPENED ... THE SPECIFICATIONS REQUIRE THE VENDOR TO PUMP OUT THE TANK AND REFILL IT WITH GOOD-QUALITY FUEL. WE ANALYZE SAMPLES...SOMETIMES STRAIGHT FROM THE TANKER...TO INSURE GOOD QUALITY. OUR SPECIFICATIONS ALSO REQUIRE SUPPLIERS TO BE AVAILABLE ON A 24-HOUR BASIS.

BIDDING BEGINS EVERY MONDAY MORNING AT 8 A.M. BY 9 A.M. ALL OF THE VENDORS HAVE PHONED IN THEIR CURRENT PRICES, AND WE ARE IN A POSITION TO PICK THE LOW PRICES FOR THE WEEK.

YOU CAN SEE HOW THE BALL HAS CHANGED CORNERS. NOW, WE HAVE THE ADVANTAGE, AND ITS OUR TURN TO SMILE AS WE WATCH OUR ENERGY COSTS GO DOWN WEEK AFTER WEEK. AS A MATTER OF FACT, SALEM WAS THE ONLY DISTRICT IN OREGON TO SEE A DECREASE IN FUEL COSTS LAST YEAR. WE FIGURE WE HAVE SAVED 10 TO 20 PERCENT OF OUR FUEL COSTS THROUGH THIS WEEKLY COMPETITIVE BIDDING PROCESS.

THIS WEEKLY BIDDING SYSTEM WILL WORK IN ANY DISTRICT. IT WILL WORK IN A ONE-SCHOOL DISTRICT AS EASILY AS IT WILL IN A LARGE DISTRICT. IT WILL WORK IN COMMUNITIES ON A RURAL DELIVERY ROUTE AS WELL AS IT DOES IN URBAN DISTRICTS.

FLEXIBILITY HELPS US CONTROL PRICES. FLEXIBILITY ALSO ALLOWS US TO CHOOSE OUR FUEL.

WHICH IS CHEAPER TODAY? GAS OR OIL? WHICH WILL BE CHEAPER TOMORROW? WHO KNOWS? THE FUEL MARKETPLACE CHANGES DAILY, AND WE NEED TO BE PREPARED FOR THOSE CHANGES.

ONE WAY WE PREPARED FOR CHANGE WAS TO CONVERT OUR BOILERS TO BURN EITHER OIL OR GAS. WHEN OIL DROPS, WE FLIP A SWITCH AND BURN OIL. WHEN GAS IS LESS, WE TAKE AVANTAGE OF THE PRICE DECREASE AND SWITCH TO GAS. AND IT'S PAID OFF. IN LESS THAN ONE YEAR, WE RECOUPED THE COST OF THE CONVERSION AND HAVE BEEN REAPING THE BENEFITS EVER SINCE. THE MORAL IS TO KEEP AS MANY OPTIONS OPEN AS YOU CAN.

HOW MUCH FLEXIBILITY DO YOU HAVE OVER WHAT YOU HEAT? DO YOU FIND ... LIKE WE DID IN SOME OF OUR OLDER BUILDINGS ... THAT YOU HEAT EVERY ROOM IN THE BUILDING WHEN ALL YOU REALLY WANT IS HOT WATER TO WASH THE FLOORS?

FOR MANY OLDER BUILDINGS IN SALEM SCHOOL DISTRICT, EARLY MORNING HOT WATER MEANT FIRING UP THE ENTIRE BOILER AND HEATING THE WHOLE SCHOOL. WE SOLVED THAT PROBLEM BY INSTALLING SEPARATE ELECTRIC WATER HEATERS IN OUR SCHOOLS.

OR MAYBE YOU FIND ... AS WE DID ... THAT YOU ARE HEATING THE ENTIRE BUILDING WHEN ALL YOU REALLY NEED IS HEAT FOR ONE PART OF THE BUILDING?

TO SOLVE THAT PROBLEM, WE CONVERTED OUR HEATING SYSTEMS TO HEAT BY ZONES AND RECOUPED OUR COSTS WITHIN SIX-MONTHS.

FOR EXAMPLE, ONE OF OUR HIGH SCHOOLS HAS SEVEN DIFFERENT HEATING ZONES. INSTEAD OF HEATING THE ENTIRE BUILDING, WE NOW SELECT THE PART OF THE BUILDING THAT NEEDS THE HEAT. THE NORTH SIDE OF THE BUILDING MAY NEED HEAT, BUT THE SOUTH SIDE OF THE BUILDING MAY BE JUST FINE. THAT'S CALLED FLEXIBILITY.

WE DON'T LIKE HEATING EMPTY ROOMS OR ROOMS THAT DON'T NEED HEAT, AND WE ALSO DON'T LIKE HEATING ALL OUTDOORS. BUT THAT'S WHAT WE WERE DOING IN SOME OF OUR OLDER BUILDINGS AS WE VENTED OUR NICELY WARMED AIR OUTSIDE THE BUILDING. AND IT WAS COSTING US A BUNDLE. TO REMEDY THE SITUATION, WE INSTALLED HEAT RECOVERY SYSTEMS. THOSE SYSTEMS RECAPTURE THE AIR WE'VE ALREADY PAID TO HEAT AND MOVE IT TO A PART OF THE BUILDING THAT NEEDS HEAT.

SO NOW WE'VE GAINED FLEXIBILITY AND CONTROL OVER WHAT WE HEAT, THE KIND OF FUEL WE USE, AND THE PRICE WE PAY FOR THE FUEL.

TIME ALSO PLAYS A BIG PART IN THE COST OF FUEL. JUST AS YOU PAY EXTRA FOR MAKING PHONE CALLS BETWEEN 8 A.M. AND 5 P.M. WHEN TELEPHONE USE IS GREATEST, ELECTRICAL COMPANIES CHARGE A PENALTY FOR PEAK LOADS.

TO KEEP COSTS FROM GOING SKY HIGH, WE INSTALLED TIMERS ON ALL OF OUR LARGE MOTORS AND AIR-HANDLING EQUIPMENT. INSTEAD OF HAVING ALL OF OUR ELECTRICITY COME ON AT 6:30 A.M., WE SET CLOCKS TO STAGGER THE LOAD. THE PEOPLE IN THE BACK OF THE BUILDING MAY COME IN EARLIER, SO WE SET THE CLOCK TO BRING ON THE BLOWER AT 6 A.M.. A BLOWER IN THE SOUTH ROOMS MAY COME ON AT 6:30, AND THE BLOWER FOR THE EAST ROOMS AT 7 A.M. THAT WAS ANOTHER CHANGE THAT GAVE US A QUICK RETURN ON OUR INVESTMENT.

TEMPERATURE, AS WE LEARNED DURING THE CARTER ADMINISTRATION, PLAYS A BIG PART IN ENERGY CONSERVATION.

TEACHERS AND STUDENTS IN OUR SCHOOLS DON'T KNOW THAT THE FEDERAL TEMPERATURE REGULATIONS ARE NO LONGER IN EFFECT. IN THIS CASE, WE TOOK AWAY THE INDIVIDUAL FLEXIBILITY OF STUDENTS AND STAFF BY INSTALLING TEMPERATURE CONTROLS ON ALL OF OUR THERMOSTATS. NO MATTER HOW MUCH THE STUDENTS FIDDLE WITH THE THERMOSTAT, THE HEAT WON'T KICK ON UNTIL THE ROOM TEMPERATURE DROPS BELOW 68 DEGREES, AND AIR CONDITIONING WON'T GO ON UNLESS THE ROOM IS WARMER THAN 78 DEGREES.

WE DON'T OVERHEAT WEIGHT ROOMS OR GYMS. AND WE KEEP OUR RESTROOMS RELATIVELY COOL. THAT NOT ONLY SAVES ENERGY, IT ALSO RETARDS BACTERIAL GROWTH.

JUST AS IT IS POSSIBLE TO OVERHEAT A ROOM, IT IS POSSIBLE TO CAUSE EYE STRAIN FROM TOO MUCH LIGHT. EIGHTY-FOOT CANDLE ILLUMINATION IS SUFFICIENT FOR DESK WORK. AND SIXTY-FOOT CANDLES ... INSTEAD OF THE 100-FOOT CANDLES OF THE PAST ... ARE PLENTY OF ILLUMINATION FOR THE HALLS. SAVING MONEY THROUGH MORE EFFICIENT LIGHTING IS A CONTINUAL PROCESS. WE SAVE ENERGY EVERY TIME WE REPLACE AN INCANDESCENT LAMP WITH A MORE EFFICIENT METALIC HALIDE OR SODIUM VAPOR LAMP.

SALEM SCHOOL DISTRICT ALSO HAS A PREVENTATIVE MAINTENANCE CREW THAT CLEANS FURNACES AND CHECKS ITEMS SUCH AS FILTERS AND FAN BELTS ON A REGULAR BASIS. YOU'D BE SURPRISED HOW MUCH ENERGY YOU LOSE JUST WITH A DIRTY FURNACE.

BUT IT TAKES MONEY TO MAKE MONEY, YOU MAY BE THINKING. FOR THOSE OF YOU WHO HAVEN'T INITIATED A CONSERVATION PROGRAM, I'LL QUICKLY EXPLAIN HOW TO GET STARTED.

EVERY STATE IS REQUIRED TO HAVE A DEPARTMENT OF ENERGY, AND THAT SHOULD BE YOUR FIRST STOP. THE DEPARTMENT OF ENERGY CAN TELL YOU WHERE TO FIND MONEY AND HOW TO APPLY AND PREPARE A GRANT PROPOSAL.

SALEM SCHOOL DISTRICT LIKE MOST SCHOOL DISTRICTS, ISN'T ROLLING IN MONEY. IN FACT, WE'VE EXPERIENCE YEAR AFTER YEAR OF BUDGET CUTS. BUT WE FOUND THE MONEY IS OUT THERE FOR THE ASKING.

WE STARTED OUT WITH A $38,000 BOARD CONTINGENCY TRANSFER IN 1980. THAT AMOUNT WAS JUST A DROP IN THE BUCKET COMPARED TO OUR ENERGY COSTS IN 1980 OF $1.3 MILLION. THE REMAINING FUNDS... TOTALING CLOSE TO HALF A MILLION DOLLARS ... WERE FROM U.S. DEPARTMENT OF ENERGY AND BONNEVILLE POWER ADMINISTRATION GRANTS AND MATCHING FUNDS FROM OUR UTILITY BUDGET GAINED THROUGH ENERGY SAVINGS.

WE STARTED WITH A DISTRICT ENERGY POLICY, AND THEN HIRED A MECHANICAL ENGINEER TO TELL US WHERE WE WERE THROWING AWAY OUR ENERGY DOLLARS. THE U.S. DEPARTMENT OF ENERGY LATER REIMBURSED THE MONEY WE SPENT FOR THAT INITIAL SURVEY. WE THEN LOOKED AT OUR BIGGEST ENERGY DRAINS AND LOOKED FOR WAYS THAT WOULD GIVE US THE FASTEST PAY-OFF.

THERE IS NOTHING GLAMOROUS ABOUT MORE EFFICIENT LIGHTING... THERMOSTATIC CONTROLS ... MECHANICAL TIMERS ... ZONE HEATING ... DUAL-FUEL BURNERS ... OR ELECTRIC WATER HEATERS...A WEEKLY BIDDING PROCESS OR PREVENTATIVE MAINTENANCE. BUT THESE MEASURES GAVE US THE FLEXIBILITY TO SAVE ENERGY. WHEN WE ADD UP THE PENNIES SAVED HERE AND THE DOLLARS SAVED THERE, WE FOUND THESE NUTS AND BOLTS ITEMS HAVE PAID THEIR WAY AND ARE EARNING US $70,000 A YEAR ... ENOUGH TO PAY FOR OUR TOTAL MIDDLE SCHOOL AND HIGH SCHOOL STUDENT BODY ACTIVITY BUDGET.

YOU MAY NOT BE ABLE TO CONTROL THE WEATHER BUT YOU CAN CONTROL THE FLEXIBILITY OF YOUR ENERGY SYSTEMS. YOU, TOO, CAN WIN IN THE ENERGY GAME.

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